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## Implementing the Fit and Strong! Program to Reduce Osteoarthritis in the Older Adult Population of Carmel, Indiana

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Lauren Alexis Bergstrom Roach, Student

Dr. Mark Swanson, Committee Chair

Sarah Wackerbarth, Director of Graduate Studies

**IMPLEMENTING THE FIT AND STRONG! PROGRAM TO  
REDUCE OSTEOARTHRITIS IN THE OLDER ADULT  
POPULATION OF CARMEL, INDIANA**

CAPSTONE PROJECT PAPER

A paper submitted in partial fulfillment of the  
requirements for the degree of  
Master of Public Health  
in the  
University of Kentucky College of Public Health

By  
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April 10, 2020

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### Abstract

Osteoarthritis is a health outcome most commonly experienced by older adults. As the “baby boomer” population continues to age, the demand for services for older adults also increases. Fit and Strong! is an evidence-based program that works to reduce symptoms of osteoarthritis in this population through an 8-week course of physical activity classes, taught by Fit and Strong! certified instructors. Carmel, Indiana, a city in Hamilton County, has a high percentage of older adults within its population, and community health needs assessments have indicated that Hamilton County citizens have repeatedly expressed a need for resources for older members of the community. To address these needs, the Hamilton County Health Department has decided to implement Fit and Strong! at three locations in Carmel, where one certified instructor will be assigned to each location. This program measures several outcomes in relation to osteoarthritis through pre- and post-tests to evaluate the efficacy of the program. Additionally, partnering with several key stakeholders and other community organizations will contribute to sustainability of Fit and Strong! in Carmel, Indiana. The combination of all of these components will be critical to the reduction of symptoms of osteoarthritis within this population.

*Keywords:* older adult, osteoarthritis, Fit and Strong!

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## TARGET POPULATION AND NEED

### Background of Carmel

Carmel is located in Hamilton County, which has a population of 323,747 people (County Health Rankings and Roadmaps, 2019). Carmel itself, however, has a population of 92,000. Carmel is representative of other mid-sized communities in Indiana according to County Health Rankings, which have 10%-20% of their population's age 65 or older, a figure likely to increase with the aging of the "baby boomer" generation (2019). As the baby boomers continue to age, the demand for services for older adults also increases (Knickman & Snell, 2002). Contrary to popular belief, the most daunting challenge to be faced as the baby boomers age will not be the economic implications, but rather will be appropriately utilizing advancements in medical and behavioral health to keep the elderly as healthy and active as possible, making community services more accessible to all age groups, and altering the cultural view of aging (Knickman & Snell, 2002). Part of this challenge includes addressing the increasing number of people who are experiencing symptomatic osteoarthritis due to the aging of the population (Zhang & Jordan, 2010).



Figure 1 – Location of Hamilton County within Indiana

Fit and Strong! is an intervention which works to improve symptoms of osteoarthritis in older adults. The Medicare-eligible population in Carmel is representative of the state of Indiana as a whole, suggesting that the success of the intervention in Carmel would offer important insights into addressing this health challenge across the state. Of the population in Carmel who

are eligible for Medicare, the rate of rheumatoid arthritis and osteoarthritis (28.4%) is nearly identical to that of the state average of 29.4% (St. Vincent Hospital, 2016).

According to the community health needs assessment of 2016 from St. Vincent Hospital in Carmel, Indiana, quotes from key informants from the community expressed a need for resources for older members of the community. Seven out of 15 key informants expressed “older adults and aging” as a population with need in Hamilton County (St. Vincent Hospital, 2016). A key theme about older adults and aging that informants expressed were resources and attention not keeping up with the growth of the number of older adults. This concern would be greatly remedied by the implementation of Fit and Strong! in this community. Small modifications will be made to the program as it stands to best tailor the program to the older adult population of Carmel, Indiana.

### *Fit and Strong! Goals*

The implementation of Fit and Strong! in Carmel, Indiana will address osteoarthritis, a significant health concern among seniors in the community. Osteoarthritis is defined as “a common degenerative disorder of the articular cartilage associated with hypertrophic bone changes” (Cinusas, 2012). Fit and Strong! is an evidence based multicomponent physical activity and behavior change program, designed for adults with a chronological age of 61 or older who experience symptoms of osteoarthritis. The purpose of Fit and Strong! is to reduce symptoms of osteoarthritis, particularly in participants’ lower extremities. Specifically the program aims to reduce symptoms of pain and stiffness, while increasing self-efficacy for physical activity, self-efficacy for ongoing exercise adherence, and maintenance of physical activity. Fit and Strong! is always implemented in a community setting, such as senior centers or

senior housing residences, and consists of 90-minute sessions three times per week, for a total of eight weeks. This program consistently produces improvements in long-term health outcomes, such as reduced pain and reduced stiffness, as reiterated by the results of randomized control trials conducted by the researchers at the Institute for Health Research and Policy at the University of Illinois at Chicago (Hughes, et al., 2006).

### Program Locations

Fit and Strong! will be implemented in the older adult population of Carmel, Indiana. To meet the needs of numerous seniors, Fit and Strong! will be implemented in three locations – Carmel Senior Living, Woodland Terrace of Carmel, and Prime Life Enrichment, Inc.. Carmel Senior Living is a senior living community with multiple living options, including independent living, assisted living, memory care, skilled nursing, and short-term rehab. Carmel Senior Living already has exercise facilities within the building, which makes this location an excellent candidate for Fit and Strong!. Carmel Senior Living employees also strongly encourage their residents to stay active, through going to available life enrichment activities as well as physical therapy, which would even further suggest that this would be an appropriate location for the program.

Woodland Terrace of Carmel has state of the art housing, amenities, and cutting-edge fitness centers with certified personal trainers. These high quality facilities would allow Fit and Strong! a prime opportunity to be successful and sustainable. Similarly to Carmel Senior Living, Woodland Terrace of Carmel is home to over 100 older adults, and has resources and employees who help promote wellness and activity. These qualities, along with their state of the art fitness



centers make Woodland Terrace of Carmel an ideal location to implement Fit and Strong! sessions.

Prime Life Enrichment, Inc. is another fitting location to implement this program, because it is different from the other locations as a nonresidential program promoting wellness, socialization, and independence in older adults in the community. Wellness and socialization are two of the qualities that Fit and Strong! teaches and facilitates, which makes this a great fit for the program. Land and aquatic exercise classes are both offered at this location, but there are not any exercises comparable to Fit and Strong! currently being offered. Certain locations will have a higher concentration of participants, most likely Prime Life Enrichment, Inc., so multiple classes will be held.

These classes may have the same instructor, or multiple different instructors may be hired on, on a needs basis. The typical Fit and Strong! class size is 20 people. Need will be calculated based on matching the standard class size, and comparing this to the estimated annual reach. By having multiple time slots for sessions, all participants will get the same experience and the same amount of attention from the instructor. This program is exclusively designed for older adults, and is designed to be inclusive of anyone who is a part of this demographic. This foundational component of the program design ensures that the content of the program is age, cultural, and linguistically appropriate.

#### Estimated Annual Reach

The target population of this intervention will be 1,000 people. After speaking with employees at all three locations, including Carmel Senior Living, Woodland Terrace of Carmel, and Prime Life Enrichment, Inc., we know that there is a capacity for the implementation of Fit

and Strong! to reach about 1,000 individuals in the first year. This is based on the number of people that each location serves, and the number of people that they could serve, if at full capacity. About 12% of the Hamilton County population is age 65 or older, which amounts to just over 11,000 individuals (County Health Rankings and Roadmaps, 2019). Of this portion of the population, about 1,000 older adults are expected to be reached annually through implementation of Fit and Strong! at these three locations.

## **PROGRAM APPROACH**

### *Fit and Strong! Instructor Training*

Fit and Strong! teaches exercises and activities that can help decrease the symptoms of osteoarthritis. Each session is led by an instructor who has successfully completed training specifically for this program. Instructor training entails two days of training. The first day involves a background of the Fit and Strong! program, as well as the findings from the effectiveness, efficacy, and dissemination studies. Additionally, this portion of training includes detailed information regarding the hands-on experience with the three components of the program (flexibility, aerobic training, and strength training). Another component of the first day of training is a detailed description of group problem solving processes which are critical for behavior change and health promotion. A significant component of this training is role playing of activities for the exercises, creation of physical activity contracts, and group discussions. Finally, the first day of training includes a description of expectations for the negotiated physical activity contract that instructors and participants create together, and a thorough description of the significance and importance of the process, outcome, and impact evaluations for Fit and Strong!. The second day of training reviews the science behind the various exercises that are

taught in Fit and Strong!, and more detailed information about all of the exercises. Finally, each instructor-in-training leads a mock exercise class, and models adaptations for participants with health issues such as painful joints.

Once trained, instructors are prepared to teach participants various exercises to reduce their symptoms of osteoarthritis. In sessions, participants are taught exercises including, but not limited to, flexibility exercises, fitness walking, strengthening exercises, resistance training, and balance exercises. Simple training equipment such as ankle cuffs and resistance bands are used in some classes, and are provided. To increase enjoyment and focus, music accompanies all exercises, and each session begins and ends with a 10-minute warm up and cool down, which reduces risk of injury. Another critical characteristic of this program is that each session includes a group discussion, which builds a sense of community and resource-sharing.

### *Services of Fit and Strong!*

Fit and Strong! incorporates several strategies to help participants maintain physical activity throughout the program. At week six of the Fit and Strong! program, instructors take time to meet one-on-one with each participant to develop a personalized fitness routine, and a maintenance contract. Instructors are expected to allot 15-30 minutes to each participant to create an individualized plan and contract. Additionally, each participant receives a participant manual, reducing potential barriers for maintenance. To address the needs of participants with limited vision, Fit and Strong! will partner with other community organizations that offer resources to make materials easily accessible to all individuals. Further details on these partnerships can be found in the Partnerships and Collaborations section.

By implementing Fit and Strong! in community settings such as senior centers, several perceived barriers for participants are eliminated. The perceived barrier of knowledge about exercise is addressed through the program activities of trained instructors teaching participants each exercise through practice with on-the-spot demonstrations, advice, and corrections by the trainer. Delivering the program in residential facilities and existing day centers will minimize the potential barrier of transportation, as many participants will not be required to leave their living community. Financial barriers for participants will be eliminated by providing the program cost-free. While the short-term barrier of stiffness and pain associated with physical activity cannot be avoided, the program is designed to progress slowly to minimize and eventually eliminate those physical discomforts and is, in fact, a key outcome of Fit and Strong!.

#### *Inclusivity of Fit and Strong!*

Fit and Strong! is always implemented in a group setting, with very specific guidelines and practices regarding what exercises and activities are taught throughout each session. These two qualities of the program will both contribute to ensuring that the program is inclusive to all individuals and non-stigmatizing. By having the entire group partake in the same activities for each session, no participant will be excluded from the educational or demonstrational aspects of the sessions. Additionally, the instructors of the program are all carefully trained to follow the program itinerary of what each session should consist of, which is another way to ensure inclusivity, as this is one of the driving principles of the program. One area where there could be room for error in inclusivity and stigmatization is in the one-on-one meetings between the trainer and each participant at week six of the program. The purpose of this meeting is to create a personalized maintenance plan tailored to each participant's needs. For this reason, there could

be biases or room for different levels of attention paid to the participants. However, each instructor of Fit and Strong! is specifically trained to eliminate this possibility. The detailed training that each instructor completes to qualify for their position includes training on how to provide equal time and resources to every participant in their 15-minute long one-on-one session together.

### *Evidence Base for Fit and Strong!*

Research suggests that certain types of physical exercise can help reduce the likelihood of developing Alzheimer's disease, which sedentary lifestyle increases the risk of, as well as improve several other health outcomes such as osteoarthritis (Chen, et al., 2019). Of the older adult population in this community, the age-adjusted death rate due to Alzheimer's disease is 29.7 per 100,000 people which is higher than that of the Indiana state average (St. Vincent Hospital, 2016). By implementing Fit and Strong! into a community that has demonstrated a need for this type of intervention, a significant increase in positive health outcomes will likely occur. Not only will osteoarthritic symptoms improve, but the program may also lead to improvements in illnesses associated with decreased physical activity, including obesity, high blood pressure, dementia, and other diseases common among senior populations. (Langhammer, Bergland, & Rydwik, 2018).

Fit and Strong! has been developed to improve health, specifically in older adults, and the psychometric values for this program are outstanding. These demonstrate the effectiveness of the program among the older population, and are further discussed in the Evaluation Measures section (Shah & Hughes, 2018). The approach of the program is to conduct the previously described sessions in locations where the target population already spends considerable amounts

of time, such as senior centers and senior residential communities. Additionally, Fit and Strong! has consistently produced results showing a decrease in osteoarthritis symptoms among participants, such as pain and stiffness (Hughes, et al., 2006). In Carmel, a community with a rapidly growing number of older adults, the implementation of programs such as Fit and Strong! are critical to the health and overall wellbeing of the county population.

Evaluation of this program in several different settings have demonstrated its effectiveness in producing desirable outcomes. This program has been implemented with over 3,100 participants, and has been evaluated for effectiveness in multiple ways for each implementation cycle. Five specific outcomes are evaluated, which are self-efficacy for physical activity, self-efficacy for ongoing exercise performance, maintenance of physical activity, pain, and stiffness. Each outcome is measured in 2-6 item surveys, all of which use a 10-point Likert scale. Further, the evaluation measures for this program have outstanding psychometric values, demonstrated strong validity and reliability for each measure previously listed (Hughes, et al., 2010).

One strategy to implement this program into the community will be to train existing physical therapy and fitness employees to instruct Fit and Strong! sessions. Not only will this capitalize on existing resources, but it will also benefit the employees, as it provides new opportunities, income, and skill sets. This will be an important implementation strategy because it will contribute to the sustainability of the program into the future, by promoting the continuation of proper implementation of the program. This function will also ideally improve the culture of the facilities in which Fit and Strong! is going to be implemented. Not only will the older adults and residents benefit, but it also creates a way for some of the instructors already employed at the locations be involved as well, and have a stake in the program. Another

implementation strategy will be to involve key community members, such as the families of residents and attendees of senior centers. As mentioned previously, support from family members may encourage more seniors to enroll and maintain participation in the program.

Additionally, increasing awareness of and excitement about participating in this program will be a key responsibility of the Community Advisory Board. Each member of the board will be tasked with talking to various community groups in which older residents are active, to promote participation. Community newsletters, local radio and television channels, as well as city and program site Facebook pages will be utilized for recruitment and publicity of the Fit and Strong! program.

#### Potential Challenges and Modifications

One challenge that can be expected is the maintenance among participants after the 8-week program has finished. Fit and Strong! has consistently shown improved symptoms of osteoarthritis in older adults, such as reduced pain and stiffness, and increased self-efficacy for physical activity and exercise adherence. However, to achieve the best results for extended time, it is critical to continue the skills and exercises taught during the program. This will be addressed in two ways: first, instructors will aim to create a strong sense of community and relationship building in each session, so that participants have a stronger connection to the program, and gain a support system with other participants. Second, at the six-week mark, instructors and participants create a maintenance contract during the same one-on-one meeting as they make the personalized fitness routine. As a modification to the program for Carmel, an exit exam will be conducted with each of the participants before the post-test, in an effort to increase sustainability

of the program, to further highlight strengths and weaknesses of the delivery of Fit and Strong! in this community.

There are also potential barriers to exercise among those with osteoarthritis, such as risk of pain, exertion, and risk of embarrassment in front of co-exercisers (Kanavaki, et al., 2017). However, research indicates that mechanical stimulus of cartilage through physical activity tends to alter the composition of cartilage, resulting in improvement of osteoarthritis symptoms (Hunter & Eckstein, 2009). Additionally, prolonged immobilization and lack of physical activity have been found to result in cartilage thinning, particularly in weight bearing joints, therefore worsening symptoms of osteoarthritis (Hunter & Eckstein, 2009). Although it may seem counterintuitive, light to moderate physical activity, including what is taught in the Fit and Strong! program, is constructive to improvement of osteoarthritis symptoms. The potential barrier of exertion can be mitigated through the distribution of participant manuals to each participant. These outline what activities are going to be taught in each session, and will reiterate to participants that the planned exercises truly are light to moderate activities.

### Community Advisory Group

A Community Advisory Group (CAG) will help lead the community mobilization planning and activities. The CAG will be comprised of Carmel's Home Place Advisory Board, which already exists and has responsibilities regarding the wellbeing of the community. This group, as it stands, holds regular meetings to decide where and how to allocate excess property tax funds, in a way which will have the greatest benefit to the public. The Home Place Advisory Board is comprised of seven members: The township trustee, the member of the Hamilton County Council that represents the largest amount of residents, a Carmel City engineer, two



citizen members appointed by the mayor, and two citizen members appointed by the Hamilton County Commissioners. This group of individuals is diverse and well representative of the overall community, making them an ideal CAG for the community mobilization planning and activities regarding the implementation of Fit and Strong! However, to achieve the best possible outcome not only for participants, but also for the greater Carmel community, additional members should be added to the CAG. Directors of the three facilities that Fit and Strong! will be implemented at, as well as at least one Fit and Strong! trainer will be added to the board. Additionally, a representative from the Parks and Recreation Department will be added. After participants complete the Fit and Strong! program, they are encouraged to maintain physical activity, and resources offered by the Parks and Recreation Department such as walking paths in outdoor settings like parks, and bike trails will ideally be frequently utilized.

#### *Recruitment and Retention of Participants*

Participants for Fit and Strong! will be recruited in various ways. Recruitment of participants in Carmel Senior Living and Woodland Terrace of Carmel will be simple, since these are both senior residence communities. Employees of these communities will work with our team to recruit participants, consistent with previous implementation of Fit and Strong!, through newsletters, announcements at community meal times, and phone calls. Additionally, advertisements through flyers and newsletters will also be posted around the residences, and will be distributed by employees to potential participants. Recruitment for participation at Prime Life Enrichment, Inc. will be different, since it is not a residential facility. Paper flyers and online flyers will be used as a recruitment technique to ensure that both seniors who do use electronic communications and those who do not will be aware of the program. These will be posted in

local churches, doctor's offices, and shops, as well as online. Another recruitment technique will be to post advertisements in local newspapers. These recruitment materials also have the potential to be seen by residents at either of the other two locations. Fit and Strong! will be an available resource for all Hamilton County residents that fit the age requirement, which is ensured through implementing the program in various locations, as well as being cost-free to participants.

Several strategies will be used to encourage retention and active participation by seniors. First, a strong sense of community and inclusiveness among participants will be built by conducting introductions and facilitating open discussions in sessions. This will be feasible, since Fit and Strong! is always implemented in a group setting. The group discussions that are part of each session will be an ideal time to ensure this. Second, a personalized fitness plan made for each individual participant by the trained physical therapists (created at the six-week mark of the eight-week program) will incentivize participants to complete the full program. A third strategy will be allowing consistent opportunity for feedback from participants throughout the eight-week course. This will give participants a chance to be heard, and to potentially give them a better experience that is more tailored to their personal preferences, needs, and interests. If and when there is consistent interest in or requests for particular adjustments to make, staff will determine the best way to achieve this. Weekly feedback will be anonymous, and will be collected by the research assistant on staff, who will compile the results and present them to the project manager and principle investigator. Then, the feedback can be reviewed, and adjustments may be made, if needed.

## **PERFORMANCE AND MEASURES EVALUATION**

Fit and Strong! will be implemented in each of the three locations, through existing systems. Each of the selected locations has a space designed specifically for physical activity, which will be the spaces that this program utilizes. Class size is anticipated to remain fairly consistent throughout each session at each location, with the target class size being 20 participants. In order to achieve improved outcomes, five outcomes are measured in the Fit and Strong! program that contribute to the overarching goal of reducing osteoarthritis symptoms. All five measures' quality is measured on a scale of 0.0 to 4.0 (Shah & Hughes, 2018).

### Outcome Goals and Measures

#### **Measures used for Evaluation of Fit and Strong! Program**

<b>Measure</b>	<b>Number of Items</b>	<b>Outcome being Measured</b>	<b>Reliability (On a 0.0 – 4.0 Scale)</b>	<b>Validity (On a 0.0 – 4.0 Scale)</b>
Efficacy for Exercise Subscale of the Lorig Exercise Efficacy Scale	3	Self-efficacy for physical activity	4.0	4.0
McAuley “Time” Exercise Adherence Scale	6	Self-efficacy for ongoing exercise adherence	4.0	3.9
Lorig Exercise Behaviors Scale	6	Maintenance of physical activity	3.4	4.0
Pain Subscale of Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)	5	Pain	3.9 (Combined score with Geri-AIMS Pain Scale)	4.0 (Combined score with Geri-AIMS Pain Scale)
Geri-AIMS Pain Scale	4	Pain	3.9 (Combined score with Pain Subscale of WOMAC)	4.0 (Combined score with Pain Subscale of WOMAC)
Stiffness Subscale of WOMAC	2	Stiffness	3.6	4.0

Source: Shah & Hughes, 2018

The first outcome is self-efficacy for physical activity, and is measured by the Efficacy for Exercise subscale of the Lorig Exercise Efficacy Scale. The goal of this measure is to assess participants' confidence in their ability to actually achieve or perform physical activity, which is the method used by the program to reduce osteoarthritis symptoms. The second outcome is self-efficacy for ongoing exercise adherence, which is measured by the McAuley "Time" Exercise Adherence Scale. Similarly to the previous measure, the goal of this measure is to assess participants' confidence in their own ability to achieve the outcome goal of ongoing exercise adherence, which is something that Fit and Strong! emphasizes. Components of the program such as the personalized fitness plan aim to assist participants in adhering to ongoing exercise, as taught in the sessions. The third outcome is maintenance of physical activity, which is measured with the Lorig Exercise Behaviors Scale, and tracks the total number of minutes of exercise each participant is doing per week. The fourth outcome is pain, which was measured using two scales. The first measure is the pain subscale of the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), and the second is the Geri-AIMS Pain Scale. Pain derived from osteoarthritis is a symptom that may be the most noticeable to the average participant on a daily basis, and therefore is a symptom that must be measured and evaluated before and after the program's implementation. The final outcome is stiffness, and it is measured using the Stiffness subscale of the WOMAC.

Additionally, the method that Fit and Strong! takes to reduce osteoarthritis symptoms is increasing proper physical activity. It is critical that the participants of this program feel confident in their ability to actually achieve and perform what the program intends, which is assessed through the self-efficacy measures. If a participant has low or no self-efficacy, they will certainly not adhere to exercise maintenance, and the program will not effectively reduce

their symptoms of osteoarthritis (McAuley, et al., 2011). This reiterates the necessity of measuring these specific outcomes as segments of the larger overarching outcome of reduction of osteoarthritis symptoms.

Self-efficacy outcomes will be measured using the six measures that were previously discussed. Each of these measures will be conducted both at baseline and after participants have completed the 8-week program. Although not a specific goal of the program, height and weight measurements are taken as a means to calculate body mass index (BMI), which is a supplemental measure used to analyze the extent of the body measurement differences that are attributable to Fit and Strong!.

Additionally, we will ask participants to report how frequently they have exercised in the past week, and what types of exercise (if any) immediately before the program. Then we will ask them to self-report on the same content after week-8. We will include an item on the survey asking about knowledge of how to perform exercise, and degree to which they actually perform such exercises.

### Evaluation

Process evaluation will be conducted throughout the program, to ensure fidelity to the original Fit and Strong! protocol. This will be done by keeping track of participant attendance, and having instructors keep track of what exercises and activities were taught and performed in each session. Instructors are expected to ensure that participants are demonstrating proper form, using appropriate weights and resistance, and are not overexerting themselves. As an additional measure of quality, the project manager will sit in on one session taught by each instructor in each 8-week implementation to review their teaching and to ensure that the Fit and Strong!

training had the desired effect on their teaching. To monitor completion, we will be able to determine how many participants completed the program by comparing numbers of initial applicants in the programs at each location to the numbers of the participants who complete the in-person survey at the end of the program. Client records, including attendance, will be taken at each location and will be returned to the project manager at the end of the program. The final survey will convey results of the program regarding the efficacy of the program itself, but the attendance records will be a better source to measure how many participants actually complete the program.

To identify and monitor the key successes, challenges, and lessons learned, two methods of process evaluation will be used. First, an activity log will be completed by the instructors at the end of each session. This will help track which of the goals were met during the session, and which behaviors were taught and demonstrated. To keep this in check, the participants will also complete a brief questionnaire at the end of each session. Their questionnaires will include an item for each exercise that was supposed to be taught during that class session, and will ask participants to rate how well they felt the behavior was taught, as well as their mastery of the skill. These questionnaires will also help staff identify differences in program implementation between program sites, which can be accounted for and altered in the week preceding that round of the program. By addressing these differences, program staff can ensure uniform implementation between program sites, and consistency.

The purpose of using these questionnaires in combination is to evaluate whether the program is meeting its time goals, in terms of completing activities as planned, as well as how effectively the instructors are teaching the exercises. Specific time goals and benchmarks are outlined in the Gantt Chart, which can be found in Appendix C. These will be collected by the

program manager at benchmarks throughout the eight weeks of the program, and the analysis of the questionnaires will highlight successes and challenges of the program thus far.

Questionnaires will be collected biweekly, which will be used for outcome evaluation. Doing so biweekly will result in quarterly outcome evaluations, which will allow program staff to make adjustments if needed. At the end of the grant period, follow-up questionnaires will be distributed to evaluate whether participants were able to maintain their physical activity regimens, as planned at week-6 of the Fit and Strong! intervention.

The post-test will be administered at week 12, to be consistent with the original Fit and Strong! protocol, which is 4 weeks after the program ends. Rather than being administered by an instructor or a research assistant, the both the pre- and post-tests will be administered by a local senior on staff. The goal of hiring and training a local senior to administer these tests is to help participants be more inclined to answer honestly, and feel more comfortable doing so. Self-report bias is always present in pre-tests and post-tests, but the goal of this modification is to minimize that limitation as much as possible.

## **PROJECT MANAGEMENT**

This project will have several key staff members, each with specific responsibilities. Principal Investigator, Lauren Roach, who is also the Director of the Hamilton County Health Department. Her responsibility in this position will be to manage the implementation of the Fit and Strong! program, and to monitor and ensure the fidelity and integrity of the implementation design and data collection. Hamilton County Health Department has implemented several public health interventions and health promotion programs which have ultimately benefited the community's health, demonstrating Ms. Roach's capability to do the same with the Fit and

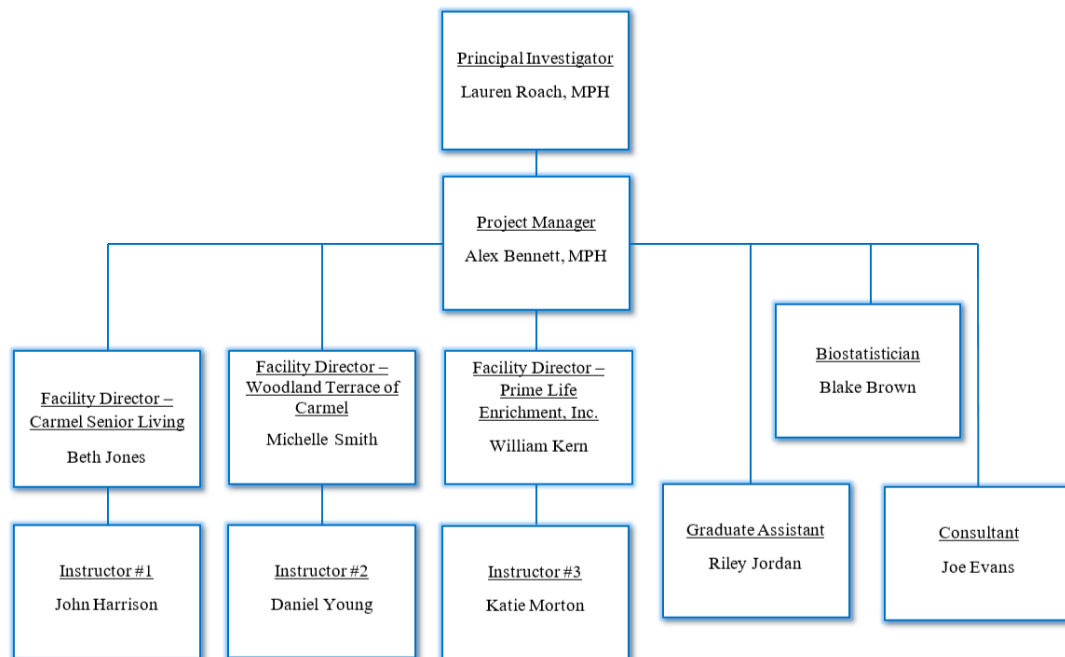


Figure 3 – Project staff reporting structure

Strong! program. Project Manager, Alex Bennett will oversee and manage the daily operations of the Fit and Strong! program, including monitoring the actual Fit and Strong! sessions, and conducting weekly staff meetings. She has a Master of Public Health degree, which gives her a strong capability of fulfilling other responsibilities, such as conducting evaluations. This is slightly different from the principle investigator's role, as that role is more distant from the daily operations, and this one is more interactive with the instructors and participants. Next, the



program will employ three Fit and Strong! certified instructors. Each instructor will be responsible for instructing the Fit and Strong! sessions at one of the three designated locations in Carmel. The three facility directors of each of the three locations, Carmel Senior Living, Woodland Terrace of Carmel, and Prime Life Enrichment, Inc. will play a critical role in the implementation of this program, as they will be the people who allow the instructors to come into their facilities to work with the older adult residents of Carmel. An additional staff member who will be on payroll will be one graduate student whose responsibility will be data collection, and organization, and then preparing reports to deliver to the principle investigator and project manager. These tasks will be done under the supervision of the project manager. Based on the size of the target population, one graduate student will be sufficient staff to fulfill these responsibilities. The final staff member on payroll will be one consultant, who will be a fellow senior citizen from the community. As described in the Evaluation subheading of the Program Measures and Evaluation section, this staff member will be responsible for conducting the pre- and post-tests with participants.

The project manager will communicate directly with the CAG to gather information, feedback, and ideas from the Carmel community. This communication will provide insight to which health concerns the community perceives as priority. Based on the findings of the process evaluations, CAG discussions, exit exam, as well as the pre-test and post-test results, adjustments may be made as needed by the principal investigator and project manager. Additionally, the project manager will lead weekly staff meetings, to ensure that everyone is working together to meet the program's goals and standards.

Adequate training for each staff member that is specific to their position will be a critical piece of the implementation of Fit and Strong!. As discussed in the Program Approach section,

Fit and Strong! instructors must go through a two-day training program, which is specific to the exercises and science of the program, making them the most suitable professionals to implement the program.

The staff required for this program is relatively small, and one of the strengths of the program is its cost effectiveness. In an effort to maximize this strength and minimize employee turnover, it is important that dedicated employees are hired in the first place. This may be reinforced through the mandatory Fit and Strong! training. Another way to minimize employee turnover will be to allow Fit and Strong! trainers to select the hours in which they schedule the sessions that they instruct.

### **CAPACITY OF APPLICANT ORGANIZATION**

#### **Capacity of Hamilton County Health Department**

The Hamilton County health department has been serving its community for decades, and has produced superior health outcomes for residents (County Health Rankings and Roadmaps, 2019). The Hamilton County Health Department is dedicated to the purpose of communicable disease prevention and health promotion for residents of all ages in Hamilton County, which aligns precisely with what Fit and Strong! aims to do. The Homeplace Advisory Board, in addition to additional key stakeholders identified in the Program Approach section, will serve as the Community Advisory Board for this program. This board has been partnering with the Hamilton County Health Department to improve the quality of life and health of residents for years, which will contribute to the comprehensive understanding of the community that the implementation of this program will require.

The Hamilton County Health Department has the ability to effectively and efficiently manage financial resources, which has been consistently demonstrated through the organization's implementation of various programming over the years, largely funded by grants. Additionally, staff management will be reinforced through weekly staff meetings, and low turnover will be addressed through activities which are further described in the Project Management section.

Management of strategic relationships with partner organizations will be another critical function of the program staff. Fostering and maintaining the relationships with partner organizations, as described in detail in the Partners and Collaboration section, will be a duty that both the project manager and principle investigator will be tasked with. This will also entail facilitating communication through appropriate channels, and promote partner activities. Further details regarding examples of partner organizations and anticipated outcomes can be found in the Partners and Collaboration section.

Several components of existing infrastructure in Carmel will be used for Fit and Strong!, enhancing the capacity of the community to effectively implement this program. The existing spaces designed for physical activity in each of the three designated locations will be utilized, as previously discussed.

Despite Hamilton County being ranked as one of the healthiest counties in Indiana, the older adult population in this community are not nearly as healthy as they should or could be. Funding for the Fit and Strong! program would allow Carmel to maximize the use of existing infrastructure in a way that benefits the overall health of the older population. Additionally, there is great opportunity for sustainability of Fit and Strong! in this community after the 3-year grant period, which would result in continued improvement of health in the older adult

population in Carmel, which will be increasingly important as the percent of the population age 65 and older continues to increase in upcoming years.

The Hamilton County Health Department, along with each of the three locations, as well as the Fit and Strong! program all have policies prohibiting discrimination in the provision of services on the basis of age, disability, sex, race, color, national origin, religion, sexual orientation, or gender identity.

### *Sustainability of Fit and Strong! in Carmel*

There are a couple other similar resources for the older adult population in Carmel, Indiana. However, none of them tailor to the needs of Carmel's older adults the way that Fit and Strong! will. One of these resources is called Motion 4 Life, which creates individualized exercise plans for members, similar to those of Fit and Strong! (Stewart, 2017). However, this resource does not include any type of group component, does not have personal, trained instructors, or any type of schedule or itinerary. Rather, it is a gym location specifically for older adults. All of the components that this resource lacks, Fit and Strong! includes, making it a beneficial resource to add to Carmel. The other resources offered that are the most similar are those offered at Carmel Senior Living, Woodland Terrace of Carmel, and at Prime Life Enrichment, Inc.. However, as explained earlier, the resources offered at these three locations are not geared towards osteoarthritis, and do not include the previously explained amenities that Fit and Strong! offers to participants. The implementation of Fit and Strong! will enhance the existing programs at each of these locations. Although the existing programs do not offer the resources that Fit and Strong! offers, they are resources that can be used to improve the

sustainability of our program. For example, Motion 4 Life has excellent facilities that participants can use to maintain physical activity after completing the program.

## **PARTNERS AND COLLABORATION**

The Health Department and Fit and Strong! team will partner with key stakeholders in the community to increase the effectiveness and sustainability of the program. In addition to the Homeplace Advisory Board members, a member of the mayor's office will act as a liaison between the project and the city government. Another community partner will be the director of the Parks and Recreation Department who will promote complimentary programs, resources, and exercise locations to the participants of Fit and Strong!. Additionally, locations offering other programs for Carmel's senior population, specifically the Motion 4 Life program and the three facilities hosting the fitness classes (Carmel Senior Living, Woodland Terrace of Carmel, and Prime Life Enrichment, Inc.) and the local YMCA will be invited to share additional fitness and health promotion opportunities with program participants. Further, Fit and Strong! will work with local vision and auditory clinics to make participant manuals and personalized fitness plans easily accessible to individuals with disabilities common among aging populations.

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## Appendix A

## Budget Justification

**A. Salaries and Wages**

NOTE: Salaries escalate at 3% per project year.

<b>Position Title and Name</b>	<b>Annual Salary</b>	<b>%FTE</b>	<b>Salary Requested</b>	<b>Fringe Requested</b>	<b>Total Requested</b>
<i>Principle Investigator Lauren Roach, MPH</i>	<i>\$100,000</i>	<i>10%</i>	<i>\$10,000</i>	<i>\$2,743</i>	<i>\$12,743</i>
		<i>10%</i>	<i>\$10,300</i>	<i>\$2,825</i>	<i>\$13,125</i>
		<i>10%</i>	<i>\$10,600</i>	<i>\$2,910</i>	<i>\$13,519</i>
<i>Project Manager Alex Bennet, MPH</i>	<i>\$50,000</i>	<i>100%</i>	<i>\$50,000</i>	<i>\$16,805</i>	<i>\$66,805</i>
		<i>100%</i>	<i>\$51,500</i>	<i>\$17,309</i>	<i>\$68,809</i>
		<i>100%</i>	<i>\$53,045</i>	<i>\$17,828</i>	<i>\$70,873</i>
<i>MPH Graduate Assistant Riley Jordan</i>	<i>\$32,000</i>	<i>50%</i>	<i>\$16,000</i>	<i>\$6,490</i>	<i>\$22,490</i>
		<i>50%</i>	<i>\$16,480</i>	<i>\$6,685</i>	<i>\$23,165</i>
		<i>50%</i>	<i>\$16,974</i>	<i>\$6,885</i>	<i>\$23,860</i>
<i>Biostatistician Blake Brown</i>	<i>\$100,000</i>	<i>3%</i>	<i>\$3,000</i>	<i>\$823</i>	<i>\$3,823</i>
		<i>3%</i>	<i>\$3,090</i>	<i>\$848</i>	<i>\$3,938</i>
		<i>3%</i>	<i>\$3,183</i>	<i>\$873</i>	<i>\$4,056</i>
<i>Instructor #1 John Harrison</i>	<i>\$30,000</i>	<i>100%</i>	<i>\$30,000</i>	<i>\$12,555</i>	<i>\$42,555</i>
		<i>100%</i>	<i>\$30,900</i>	<i>\$12,932</i>	<i>\$43,832</i>
		<i>100%</i>	<i>\$31,827</i>	<i>\$13,320</i>	<i>\$45,147</i>
<i>Instructor #2 Daniel Young</i>	<i>\$30,000</i>	<i>100%</i>	<i>\$30,000</i>	<i>\$12,555</i>	<i>\$42,555</i>
		<i>100%</i>	<i>\$30,900</i>	<i>\$12,932</i>	<i>\$43,832</i>
		<i>100%</i>	<i>\$31,827</i>	<i>\$13,320</i>	<i>\$45,147</i>
<i>Instructor #3 Katie Morton</i>	<i>\$30,000</i>	<i>100%</i>	<i>\$30,000</i>	<i>\$12,555</i>	<i>\$42,555</i>
		<i>100%</i>	<i>\$30,900</i>	<i>\$12,932</i>	<i>\$43,832</i>
		<i>100%</i>	<i>\$31,827</i>	<i>\$13,320</i>	<i>\$45,147</i>
<b>Total Personnel Y1</b>			<b>\$372,000</b>	<b>\$64,526</b>	<b>\$233,526</b>
<b>Y2</b>			<b>\$383,160</b>	<b>\$66,462</b>	<b>\$240,532</b>
<b>Y3</b>			<b>\$394,655</b>	<b>\$68,456</b>	<b>\$247,748</b>

**Lauren Roach, MPH, Principle Investigator (10%).** Lauren Roach is the Public Health Director at the Hamilton County Health Department. She will be dedicating 10% of her time to the implementation of Fit and Strong! in Carmel, Indiana for each year of this grant. She has extensive experience working in this community, as well as with many partner organizations for this program. Her responsibilities in this role will include interpreting results of process evaluations, communicating with partners, and leading CAB meetings. She will also be responsible for disseminating results of the program through publications and presentations.

**Alex Bennet, MPH, Project Manager (100%).** Alex Bennet will be responsible for overseeing the day-to-day activities of the program, such as those outlined in the logic model found in



Appendix B. Alex Bennet will dedicate 100% of her time to the implementation of this program, and in addition to overseeing daily functions, she will also serve as the fidelity coordinator. This will entail monitoring each location to ensure that all instructors are following Fit and Strong! protocol, and are all uniform with each other.

**MPH Graduate Assistant (50%).** Riley Jordan is an MPH student at Indiana University, who will dedicate 20 hours per week to this project. Riley will be responsible for compiling the results of weekly surveys to be interpreted by the Principle Investigator.

**Biostatistician (3%).** Blake Brown is a biostatistician who will be tasked with analyzing the results of the pre- and post-tests. Blake will dedicate 3% of their time to this, as this will be a relatively succinct and straightforward task to complete for each round of the 8-week program.

**Instructors (100%).** All Fit and Strong! instructors will spend 40 hours per week training older adults from the community for all 3 years of the grant. As described in the Program Approach section, the instructors will follow the outlined Fit and Strong! program plan, which will last 8 weeks each.

#### **B. Equipment and Marketing Supplies**

<b>Item Requested</b>	<b>Cost Per Unit</b>	<b>Number Needed</b>	<b>Year 1 Requested Amount</b>	<b>Year 2 Requested Amount</b>	<b>Year 3 Requested Amount</b>
<i>Ankle Weights</i>	\$28.87	60	\$1,732.20	\$173.00	\$173.00
<i>Exercise Bands</i>	\$9.95	60	\$597.00	\$60.00	\$60.00
<i>Mats</i>	\$14.25	60	\$855.00	\$86.00	\$86.00
<i>Participant Manuals</i>	\$35.00	1,000	\$35,000.00	\$35,000.00	\$35,000.00
<i>Speaker</i>	\$99.95	3	\$299.85	\$100.00	\$100.00
<i>Music Streaming Platform</i>	\$9.99	36	\$359.64	\$360.00	\$360.00
<i>Flyers</i>	\$0.50	1,000	\$500.00	\$500.00	\$500.00
<i>Radio Ads</i>	\$88.00	15	\$1,320.00	\$1,320.00	\$1,320.00
<b>Total Equipment and Supplies Cost:</b>			<b>\$40,663.69</b>	<b>\$37,598</b>	<b>\$37,598</b>

The main cost of supplies will be the necessary equipment for each location. Participant manuals are the largest cost of all the supplies, as they are a recurring cost each year. Equipment costs for Year 1 are described by the cost of equipment and numbers needed, and the amount requested for Years 2 and 3 are based on an estimate that 10% of each type of equipment will need to be replaced. The costs of flyers are a standard cost, and the costs of the radio ads are based on the local rate in Hamilton County, Indiana.

**C. Travel**

<b>Type of Travel</b>	<b>Cost per Unit</b>	<b>Number Needed</b>	<b>Year 1 Requested Amount</b>	<b>Year 2 Requested Amount</b>	<b>Year 3 Requested Amount</b>
<i>Mileage</i>	<i>\$0.55</i>	<i>1,000</i>	<i>\$550.00</i>	<i>\$550.00</i>	<i>\$550.00</i>
<i>Lodging</i>	<i>\$250.00</i>	<i>3</i>	<i>\$0.00</i>	<i>\$0.00</i>	<i>\$750.00</i>
<i>Airfare</i>	<i>\$400.00</i>	<i>1</i>	<i>\$0.00</i>	<i>\$0.00</i>	<i>\$400.00</i>
<i>Registration</i>	<i>\$350.00</i>	<i>1</i>	<i>\$0.00</i>	<i>\$0.00</i>	<i>\$350.00</i>
<i>Per Diem</i>	<i>\$75.00</i>	<i>4</i>	<i>\$0.00</i>	<i>\$0.00</i>	<i>\$300.00</i>
<i>Ground Transportation</i>	<i>\$100.00</i>	<i>1</i>	<i>\$0.00</i>	<i>\$0.00</i>	<i>\$100.00</i>
<i>Baggage</i>	<i>\$50.00</i>	<i>1</i>	<i>\$0.00</i>	<i>\$0.00</i>	<i>\$50.00</i>
<i>Airport Parking</i>	<i>\$50.00</i>	<i>1</i>	<i>\$0.00</i>	<i>\$0.00</i>	<i>\$50.00</i>
<b>Total Travel Costs</b>			<b>\$550.00</b>	<b>\$550.00</b>	<b>\$3,100.00</b>

The outlined expenses for mileage will be allocated solely to the Project Manager. As this role will entail fidelity monitoring, it will also entail commuting to each separate location on a regular basis. All other travel costs will be allocated to funding the Principle Investigator's travels to a conference at the end of the grant period to present and disseminate the findings of the pre-tests and post-tests, and the results of the program.

**D. Instructor Training**

<b>Instructor</b>	<b>Cost per Hour</b>	<b>Number of Hours</b>	<b>Total Requested Amount</b>
<i>John Harrison – Carmel Senior Living</i>	<i>\$30.00</i>	<i>8</i>	<i>\$240.00</i>
<i>Daniel Young – Woodland Terrace of Carmel</i>	<i>\$30.00</i>	<i>8</i>	<i>\$240.00</i>
<i>Katie Morton – Prime Life Enrichment, Inc.</i>	<i>\$30.00</i>	<i>8</i>	<i>\$240.00</i>
<b>Total Instructor Training Costs</b>			<b>\$720.00</b>

Fit and Strong! requires all instructors to complete a specific training program, which instructors receive their normal hourly pay during. This is a one-time training program, therefore it is also a one-time cost. Fit and Strong! training is regularly held in several locations in Indiana, which the 3 instructors hired for this grant will attend prior to the first round of sessions.

**E. Other**

<b>Other Expenses</b>	<b>Requested Amount Year 1</b>	<b>Requested Amount Year 2</b>	<b>Requested Amount Year 3</b>	<b>Total Requested Amount</b>
<i>MPH GRA Tuition</i>	<i>\$12,000.00</i>	<i>\$12,500.00</i>	<i>\$13,000.00</i>	<i>\$37,500.00</i>
<b>Total Other Costs</b>				<b>\$37,500.00</b>

Tuition is requested for each of the three years of the grant period to allocate to the graduate research assistant. Only one graduate research will be hired, keeping the total requested amount for this expense relatively low.

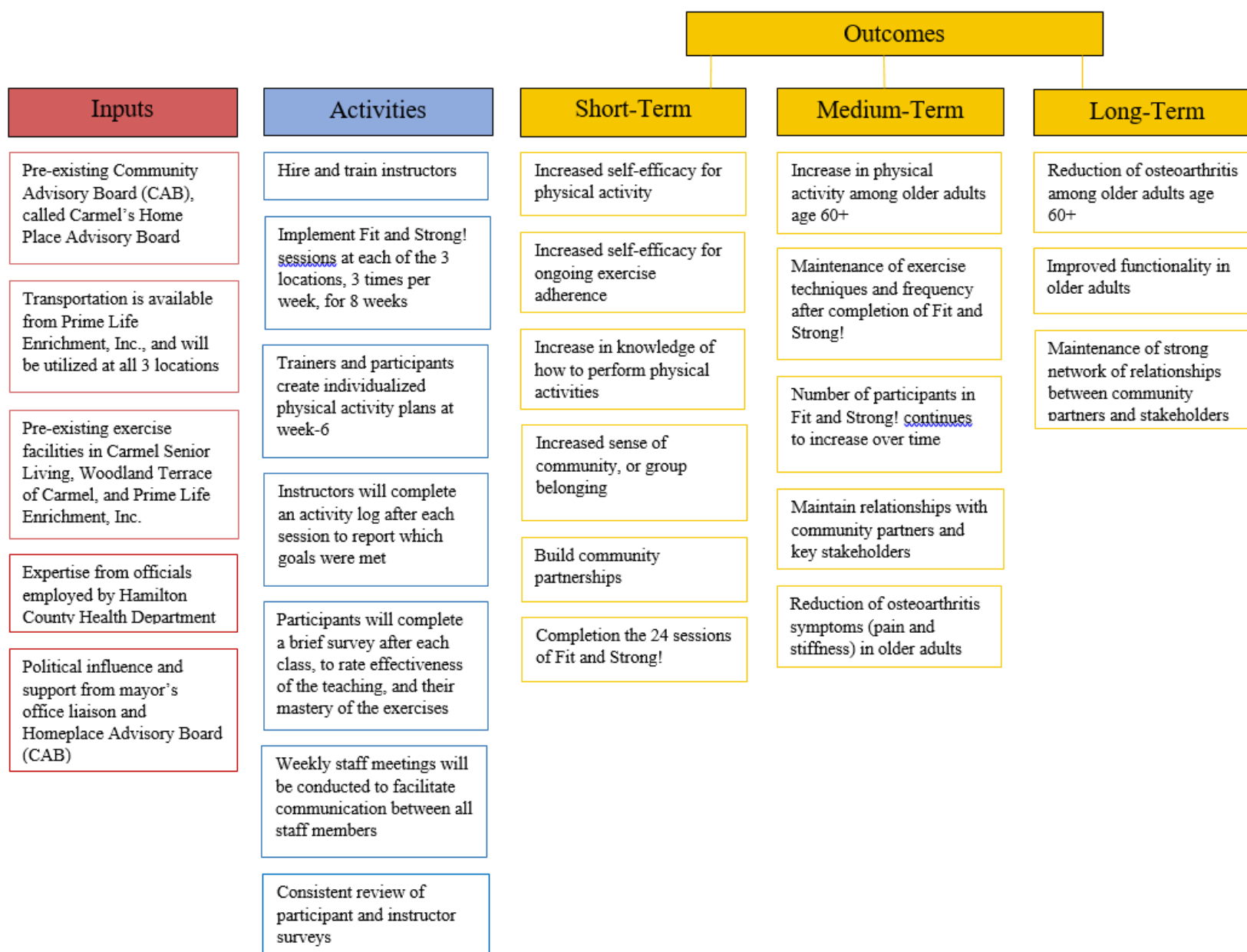
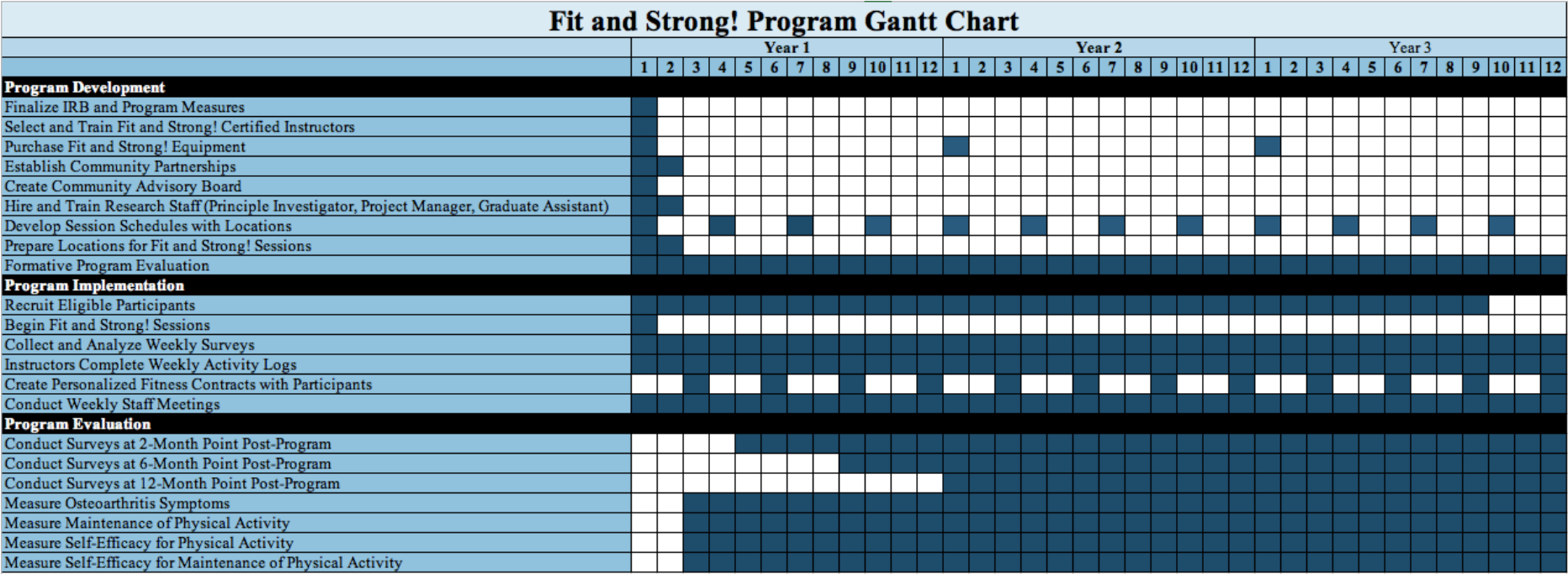


Figure 2 – Logic model for implementation of Fit and Strong!



Gantt Chart  
Appendix C